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ABSTRACT

This conference paper analyzes educational finance from the standpoint of human capital, noting the external economic and social benefits that result from educational expenditures. A case is made for publicly sponsored adjustments to the market mechanism to insure an optimum allocation of educational resources. (LLR)

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Some Economic Considerations for Determining Additional Educational Expenditures

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It has long been recognized that education has numerous dimensions not the least important of which has to do with economics. At a time when much of the nation's conflicts, indeed some fundamental social crises, are non-separable from educational institutions, it is not at all surprising that such institutions must seek to articulate clearly additional rationale for continued adequate public support. As a rule, the educational establishment has failed to provide sufficiently clear guidelines for legislative fiscal action. Too often it has relied upon irrelevant statistics and spurious and specious correlations. But it need not do so. By applying some of the criteria and analytical tools developed by social scientists, especially in the area of collective decision-making, we may now be much closer to arriving at important public decisions in some scientific manner. The object of this presentation is not to discuss current financing issues but rather to indicate something of the broad theoretical contributions which economists have been making in this realm. In general we shall be discussing the strengths and weaknesses of 2 or 3 of the tools in the inventory of economists which may be useful in determining the proper amount of expenditures on education which should be forthcoming in the foreseeable future. The material is extracted from a forthcoming National Education Finance Project volume and we shall limit ourselves to just a few of the many important concepts which are contained in that collection

of studies.[1] Specifically I shall comment on the contribution of education to income and to the nation's capital stock and its economic growth. I shall also briefly comment on some of the spillovers both social and economic resulting from the output of the education industry.

Education is a commodity and there is an education industry which currently absorbs about 7 per cent of the Gross National Product. This industry produces an identifiable and saleable product which even has a price. To this extent it appears to be no different than, say, a painting or a movie, or even a 4-inch-wide tie. But education is not simply a consumption good. For along with its personal short-run benefits and satisfactions, education has a long-run economic impact upon the one who is educated and his society. It effects, sometimes dramatically, the lifetime stream of income of the recipient in the same way that the ownership of a machine or land does. The ownership of physical and financial capital provides the individual owner with an expected flow of income over time which is greater than what would be his flow if he did not have this capital. The reason for this is that the presence of more real or physical capital improves man's personal productivity. Under normal assumptions, any increase in the capital-labor ratio contributes positively to the average productivity of labor. The same basic influence upon labor's income flow may be expected from education, for it too appears to contribute to man's productivity. Indeed, its effects are so analogous to almost all elements of physical capital that a whole school has developed around the concept which has become known as "human capital," and while several factors can enhance it, education is usually considered the major determinant of the size of the human capital stock. But the human capital stock is merely a

component of the total stock of capital and therefore the efficient allocative decision with respect to education is analogous to the allocative decision with respect to, say, plant expansion--namely, to this extent, it is an investment decision. This approach -- the human capital approach -- assumes therefore that the form and amount of human capital can be altered by an appropriate investment; and since resources are scarce, efficiency dictates that the investment be made in accordance with the priorities set by the relative rates of return on all competing investment opportunities -- human and non-human. In other words, the use of this concept dictates that additional investment funds flow to education only if and when its rates of return exceed those in the rest of the economy. And within education the same principle would be applied between, say, pre-kindergarten and graduate work, or even colleges of education and colleges of business administration. It would take a great deal more information than we now have concerning the likely impacts upon the expected future streams of income which result from various investments, but such information is no less attainable than is the identical type of information which is necessary for decision-making with respect to physical capital. How do we determine the efficiency of investments in a pipeline or a particular size pipeline? We do so on the basis of expected future streams of net income with all the uncertainties thereof appertaining. But it has worked and quite successfully for a long time in a great many sectors. It certainly can also work in determining which educational investments in man should be encouraged when economic efficiency is the criterion. If the expected stream of income of physicists is lower than the expected stream of economists (and, incidentally, this is the case), then education resources should be diverted from

physics to economics. To do otherwise is to interfere with the optimum accumulation of human capital. Fortunately, such misallocation does not go on for too long since the market process usually exhibits its self-correcting powers most strikingly. As the products dependent upon any man's intellect and skills yield less satisfaction to consumers, so these products fall in market value and hence their producers experience a drop in lifetime incomes. I suggest that traditional areas of agriculture and also engineering are precisely in this phase currently and intelligent political decision-making would call for a very careful re-evaluation of the related priorities. I suggest also that similar misallocations may have occured with respect to <u>levels</u> of education. There is some evidence that rate of return to marginal investments in elementary and high school education are at least twice as large as are the returns at the college level. But political pressures and non-economic criteria may have forced us to disregard this situation.

In the forthcoming NEFP volume, Professor T. W. Schultz, the leading figure behind the human capital approach to education, presents a rate of return profile that characterizes U.S. education. Higher education in general, undergraduate and graduate, shows a fairly stable pay-off over time of about 15 per cent, which is very similar to the rate of return on investment in the economy taken in its entirety. High school, on the other hand, appears to show a rising rate of return since World War II, upward of 25 per cent for white males, while elementary schooling has been yielding well over 35 per cent.[2]

Finally, I suggest that there has been very serious misallocation in terms of this human capital approach with respect to educational investment

in white suburban upper middle class schools. I suspect that the possible rates of return at the margin are very much higher in the black ghettoes and the rural areas than in Scarsdale or Montgomery County. If so, there is sound economic reason for greater educational investment in these disadvantaged areas aside from any moral argument.

Enough. The concept is not difficult to perceive. The present value of the expected future stream of income of a person is his human capital value and, by examining the increase in that stock of value attributed to education. we may learn something of the nature of our policies in the past. Permit me to summarize these. First, we have invested a great deal in educational capital--indeed, its rate of growth has been about twice the rate for non-human reproducible capital. Schultz estimates about 5 per cent as compared with 2 per cent since 1919.[3] Second, this relatively higher rate has persisted throughout the sixties. Third, despite its size and growth, the educational stock of capital is sub-optimal because too often economic efficiency considerations have been ignored. Let me cite a few cases.

First. Unemployment often impairs the skills and reduces the knowledge one has acquired. Machines can be placed in storage for years; a corps of engineers or craftsmen cannot. To the extent that we permitted obscenely high levels of unemployment in the early 60's and are doing so again at present, then we are reducing the future capital stock of this country.

Second. Educational capital has a high rate of obsolescence. We still have much to learn about these processes, but we do know that retirement, sickness, new techniques of production, changes in the demand for skills, advances in science and their applications in engineering--all

these render certain forms of human capital less productive and useful. Whether we should concentrate, therefore, on more highly technical skills (to satisfy the moment) or general education and therefore more on-the-job training (and hopefully more flexibility) is still a debate among the professionals, though the generalists appear now to have the upper hand. (Or am I beginning to hear more support for the "vocationalists"?) In this context, we will have to give thought to the short and long run tradeoff.

Third. The distribution of educational capital points out some possible inefficiencies as well. (a) Investment in education is weighted in favor of youth. They acquire new skills which often render the skills of the aged obsolete. Along with economic problems, this trade-off presents some important policy problems which have to do with financing human welfare. (b) Much of the distribution of educational capital is a function of the distribution of personal income. Children of the poor acquire less schooling and, as a rule, inferior schooling and probably incorrect schooling. We know perfectly well that schooling is neither free nor equal. It is costly and probably should be much more directly subsidized on a basis inversely related to personal income though the reasons for this should be made much more explicit. (c) While the quantity of education has become more and more equalized throughout the nation (that is, in terms of average number of years of schooling and the number of days in a school year), the quality appears to differ greatly. But so much more research needs to be done with respect to the meaning of quality education. In our judgment, the educators have grossly neglected the explicit meaning of the term "quality education" without which I simply would not know how to defend many of the additional funding requests which will continue

to be forthcoming. More money may simply mean more spending and not necessarily more or better education.

We have saved for the last in this section the inefficiencies resulting from the human aspect of human capital--that is, the effect of social, institutional and legal prescription and practice. The one overriding fact which renders human capital so different from physical capital is that a person cannot really indenture himself or encumber his human rights. If he does borrow for educational purposes, the lender does not have the control over his investment as is ordinarily the case. Thus private lending in this sphere is naturally quite limited though imaginative suggestions concerning this matter have been appearing.

A second source of inefficiency in this context is the discrimination implied or overt against women who, as a result, are undereducated and so often underemployed, and against racial minorities, especially blacks. Job and school discrimination reduces the economic incentives of these people to acquire the amount and quality of schooling they might otherwise have. If the rate of return on the additional cost of completing high school is 25 per cent to a white schoolboy and near zero for a black one, then economic rationale would predict the former to graduate and the latter to quit--or at least not to try very hard. Work by Finis Welch and Roy Lassiter, among others, bears out the contention that substantial discrimination exists in the job and schooling markets and that it becomes more and more significant economically as educational levels increase.[4] For example, one study shows that for those who complete the 7th grade, racial discrimination costs the black $790 per year; but if he should complete high school, he pays $1950 for his color.[5]

Granted that all these institutional, social and legal phenomena reduce the efficient allocation of resources, how might these be remedied to some extent? Time does not permit us to do any more than list the areas where there can be some imaginative improvement. These include a much expanded use of private capital markets to provide loans to students--especially at the higher educational levels; a greatly improved supply of information concerning alternative educational opportunities; and finally a serious consideration of much greater consumer or student sovereignty in influencing the investment allocation decision. There is widespread belief in the argument that student self-interest is sufficient to bring about greater school competition and hence more efficient allocation of investment resources to education. Perhaps this is why economists across the political spectrum--from Heller and Samuelson to McKracken and Friedman--find attraction in the voucher scheme or at least some variation of it.

Let us now turn to a related approach to the economic evaluation of education, one which focuses attention upon the aggregate economy rather than the individual's private income. I refer to the interest economists have demonstrated in measuring the actual effects of education upon the nation's economic growth. Along with Schultz, Edward Denison and Mary Jean Bowman stand out as the more important contributors to this discussion. Generally, economists tend to measure the growth impact merely by summing the differential earnings of individuals which were attributed to increments of education. That is, they used essentially the same assumptions and

data embodied in the human capital approach. The effect on the aggregate is simply the sum of the effects on the individuals. Therefore, any problems inherent in estimating individual rates of return are therefore embodied and perhaps magnified in the national estimates. On this basis, Dennison estimated the educational component of growth for 9 Western nations during the decade of the fifties.[6] For some countries, including the United States, education is credited with as much as .5 of a percentage point of the annual growth.[7] What proportion this is will of course depend partly upon the size of the <u>overall</u> rate of growth and it is no surprise to find that nations with low growth rates during the fifties exhibit <u>relatively</u> high contributions from education, while for nations with very high overall rates, education may not appear too significant a contributor.

The most serious problem with such growth studies is that after giving due credit to all other identifiable inputs, whatever residual is left is credited to education. But this means that there is really no <u>independent</u> validation of the implicit hypotheses concerning the contribution of any of the factors to growth and in fact it is very possible to over-explain the growth where, for example, educational advance has been rapid and yet the economy has stagnated. Indeed, this is precisely what happens if you apply the Denison-type model to the Soviet Union in the 1930s. What we need is a procedure which can circumvent such problems and economists have now come up with a promising one. We shall not bore you with the technical character of this approach, which studies the aggregate production function econometrically, but preliminary results from the two or three studies completed appear to be most promising.[8] They do show us that the evidence is present that education per se has

explained some of the aggregate growth though perhaps not as much as economists once believed. But the reasons behind this contribution are in no way obvious. Much of this information still depends upon relative wage rates, so that graduating more high school students may in fact contribute to growth figures when there are few high school graduates, but as the number of these graduates increases, their relative wage advantage may in fact decline (since they are no longer in scarce supply), in which case further expenditures on high school education would not likely contribute as much to growth. And there is another element. As larger and larger majorities of each age cohort complete high school, those who remain behind may increasingly possess less ability, or society tends to treat them as if they do. It would therefore be falacious to assume similar rates of return to additional high school graduates. These are important points for policy purposes. They bear out the fact that economic models at present tell us little if anything about the processes by which education may contribute to growth. In the judgment of many economists, they themselves - i.e. economic models, do not provide sufficient justification for further increased expenditures on education. All they tell us is that some of the unexplained components in a nation's past growth is very likely to have been due to educational changes and increases, but at the same time, the dynamic process of growth and the change in the educational mix make it very dangerous to predict that further expenditures on schooling would be an efficient way to encourage growth. We need more specific empirical research of particular educational programs precisely along the lines of some of the studies sponsored by the National Education Finance Project. For it is such "micro" studies which may provide us with information con-

cerning the way education really works upon man and his environment so that we may then have more solid basis for presenting educational policy to improve the nation's economic lot and that of its citizens. For too long now, social scientists in general and economists in particular carried out their research and then prescribed policies completely oblivious to the other disciplines who often live next door. The fact that there has been a growing union between at least two disciplines, economics and professional education administration, is a very important development.

The economic dimensions of education discussed thus far may contribute something to the determination of the efficient allocation of resources, but neither the human capital or rate of return approach nor the impact on economic growth provides us with any strong a priori efficiency arguments for more public responsibility in education. That is, because someone's income increases with his educational level merely suggests that optimum resource use and economic growth dictate that investment in education should take place but not necessarily by the public sector. Perhaps on other grounds, i.e., non-economic, such public investment should occur, but the factors we have discussed thus far are not sufficient conceptually for the support of more direct public involvement.

What we need to demonstrate is that while education is similar to movies or ties or even factories or machines, that is, typical private goods, it is also very significantly different. For unlike such private goods, education yields benefits to others in addition to the student himself. Whether or not you yourself buy any more education, you may be

better off simply because I buy more education. In the technical jargon of the economists, education exhibits externalities or spillovers in that it affects people who do not choose to buy it directly. This is not true of 4-inch ties.

The significance of the presence of externalities is that a private solution will not be economically efficient in that external benefits (or spillovers) will not be included in the student's decision equation and therefore there will be underprovision of resources to education. In other words, the student (or his family) will be willing to spend just enough to cover all the benefits he himself expects to receive. But what about any secondary benefits received by others? To the extent that there is no adequate mechanism for charging for these latter benefits, they are simply disregarded which results in under-allocation and therefore misallocation of resources.

What are these secondary benefits? Some are economic in nature, while others are of broader social character. Of the first type, we would include the view that education improves the environment in which production takes place, improves the plant coordination and discipline, permits much greater flexibility and adaptability, and therefore greater ability to recognize technical improvements and incorporate them into the production process. Also of an economic nature are the spillovers attendant with lack of education. The costs imposed upon all individuals as a result of unemployment and crime, for example, make it of economic interest to citizens at large to reduce these occurrences. To the extent that education contributes to their reduction, the employed law-abider has an interest in education decisions.

The second type of externality, namely social spillovers, also accompany education but they promote non-economic ends. These are, perhaps, the most significant effects of education for they may be the ultimate hope for the preservation of a free and democratic society. For it teaches us of the process of democratic institutions and an appreciation of these, and at least as important, if not of greater importance, it may well be the sine qua non for promoting equality of opportunity. Education appears to be the most effective instrument for compensating a socially and economically inferior origin.

Given these externalities, spillovers or neighborhood effects, if you will, an optimum resource allocation to education can not be left to the happenstance of the market. Instead, some publicly sponsored adjustments must continue to be made to insure an efficient solution as well as an equitable one. In our judgment, the further study of these benefits and costs and especially their specification and quantification is the most important work facing economists at the present. The professional literature is beginning to show clearly the appreciation for this point of view, and we feel confident that you who are policy-makers will, before long, find much use in our research. In some fields the analysis has gone very far - in the defense sector since Mr. MacNamara and most recently in the whole area of health. The cost benefit analysis which used to be limited to the Corps of Engineers (and they did this rather poorly), is now very much used in determining the priority of health programs. We must see more of this in education.

The time is very near for the process of collective decision-making to be based upon more scientific methods with results which would surely

be more utility maximizing for individuals and society as a whole. Whether or not this means more for education will depend upon whether we educators can improve our product and prove that our industry is worthy of more of our nation's scarce resources. You, who are the policy-makers, ought to insist upon this.

NOTES

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1 R.L. Johns, I.J. Goffman, et al., editors, Economic Factors Affecting the Financing of Education, Gainesville, Florida, 1971, especially chapters 2, 3 and 4.

2 Ibid., chapter 2.

3 Ibid.

4 Finis Welch, "Labor-Market Discrimination: An Interpretation of Income Differences in the Rural South," Journal of Political Economy, V. 75, No. 3, June 1967. Also Roy F. Lassiter, "The Association of Income and Educational Achievement," University of Florida Monographs, Social Sciences - No. 30, 1966.

5 Finis Welch, p. 239.

6 Edward F. Denison, Why Growth Rates Differ, The Brookings Institution, Washington D.C., 1967.

7 Ibid., Table 21-1, p. 298.

8 See for example, D.W. Jorgenson and Zvi Grilliches, "The Explanation of Productivity Change," Review of Economic Studies, Vol. 34, Autumn 1967, pp. 249-283.